



# 30GN,GT,GTN,GTR,GUN,GUR,HK,HL 38AH,AKS Accessory Hot Gas Bypass Packages 50/60 Hz

## Installation Instructions

30GA900161 (60 Hz — 115-v Control)  
30GA900171 (50 or 60 Hz — 230-v Control)

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### SAFETY CONSIDERATIONS

Installing, starting up, and servicing air-conditioning equipment can be hazardous due to system pressures, electrical components, and equipment location.

Only trained, qualified installers and service technicians should install, start up, and service this equipment.

When working on air-conditioning equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment.

Follow all safety codes. Wear safety glasses and work gloves. Use care in handling equipment.

#### **⚠ WARNING**

Be sure power to equipment is shut off before performing maintenance or service.

**IMPORTANT:** When removing refrigerant, use an approved refrigerant recovery device. Do not vent refrigerant into the atmosphere.

### INTRODUCTION

These instructions cover field installation of the accessory hot gas bypass (HGBP) valve and solenoid pilot valve on specific models. These models include the 30GT Flotronic™ chillers and 30GN Flotronic II chillers in sizes 040-420. Also included are all 30GTN,GTR,GUN,GUR040-420, 30GTN015-035 and 30HK,HL040-060 ComfortLink chillers. See Table 1.

On Flotronic chillers (30GT) with either no unloaders or 2 unloaders, the accessory hot gas bypass must be added to both circuits because of an automatic lead-lag feature. On ComfortLink chillers (30GTN,GTR,GUN,GUR040-070 sizes), the addition of a compressor unloader solenoid coil must also be added to compressor B1 to use the configurable lead-lag feature.

On 30GN,GT,GTN,GTR,GUN,GUR130-210 sizes, 2 hot gas bypass packages must be installed, one on each circuit. On 30GN,GT,GTN,GTR,GUN,GUR230-420 sizes, 4 hot gas bypass packages must be installed, 2 on each unit module (Modules A and B).

**IMPORTANT:** The following 2 combinations ARE NOT ALLOWED on 30GN,GT,GTN,GTR,GUN,GUR230-420 units.

- Two unloaders and hot gas bypass on one circuit.
- Four compressors, 1 unloader, and hot gas bypass on one circuit.

For 30GT units, hot gas bypass will be activated only if the lead compressor on a circuit is active. For 30GN, 30GTN,GTR, 30GUN,GUR and 30HK,HL units, hot gas bypass will be activated only if the lead compressor on a circuit is both active and unloaded.

**NOTE:** The lead compressor in circuit A is compressor A1. The lead compressor in circuit B is compressor B1. For location of lead compressor, refer to component arrangement in wiring schematic on unit.

**Table 1 — Accessory Application**

UNITS	UNIT TYPE	CONTROL VOLTAGE	HOT GAS PART NO. 30GA900-
30HK040-060 30HL050,060	50/60 Hz	115 v	161
30GTN015-035	60 Hz 60 Hz	115 v 230 v	161 171
30GTN020-030	50 Hz	230 v	171
30GN,GT,GTN, GTR,GUN, GUR040-420	60 Hz 60 Hz 50 Hz	115 v 230 v 230 v	161 171 171
38AK,AKS	60 Hz 60 Hz 50 Hz	115 v 230 v 230 v	161 171 171
38AH	60 Hz 60 Hz 50 Hz	115 v 230 v 230 v	161 171 171

## INSTALLATION IN 30GN,GT,GTN,GTR,GUN,GUR,HK,HL CHILLERS

**Step 1 — Examine Package Contents —** Package includes hot gas bypass valve, solenoid pilot valve, and instructions. Examine each item. If any part is damaged or missing, file a claim immediately with the shipper. See Table 2 for accessory package contents and field-supplied material.

### Step 2 — Install Piping

#### ⚠ WARNING

Shut off all power to the unit and remove refrigerant charge from circuit(s) using an approved refrigerant recovery device before proceeding with installation.

30GN,GT,GTN,GTR,GUN,GUR040-420 UNITS — See Fig. 1.

**NOTE:** For 30GN,GT,GTN,GTR,GUN,GUR230-420 units, install bypass line, bypass valve, solenoid pilot valve, and manual shutoff in each circuit of each unit module.

**Bypass Line** — Install field-supplied copper tubing between the hot gas discharge line and the entrance to the cooler. Two factory-sealed stubs are provided in each circuit, one on the discharge line after the compressors and before the vertical riser, and one on the liquid line between the expansion valve and the cooler. See Fig. 1 and 2.

**Bypass Valve** — Install the bypass valve as close to the cooler as possible. This minimizes the amount of liquid that can be stored in the line. The bypass valve has a 5/8-in. ODF inlet and outlet, and a 3/8-in. ODM equalizer port. *To ensure proper operation, install the bypass valve in a horizontal section of the bypass line, with the solenoid pilot valve installed directly above the body.*

**Table 2 — Accessory Package Contents and Field-Supplied Material**

ITEM	30GT040-420*	30GN040-420*	30GTN015-035 30HK,HL	38AK,38AKS,38AH/ INDOOR COIL	30GTN,GTR, 30GUN,GUR040-420
HGBP Relay, 115-v Control Power	HN61KK912	—	—	—	—
HGBP Relay, 230-v Control Power	HN61KK913	—	—	—	—
HGBP Relay, 20 vdc ckt	—	HK35AB001	—	—	—
HGBP Relay, 24-v ckt	—	—	—	HN61KK324†† HN61KJ510	—
Time-Delay Relay	HN67ZA001	—	—	—	—
Resistor, (1/2 W; 620,000 ohm)	30GT511259	—	—	—	—
Filter Drier Cores†	KH29EZ050		—	—	KH29EZ050
Copper Tubing, Wiring, Fittings**, Connectors**, Filter Driers, Conduit, and Manual Shutoff Service Valve	Field Supplied				

#### LEGEND

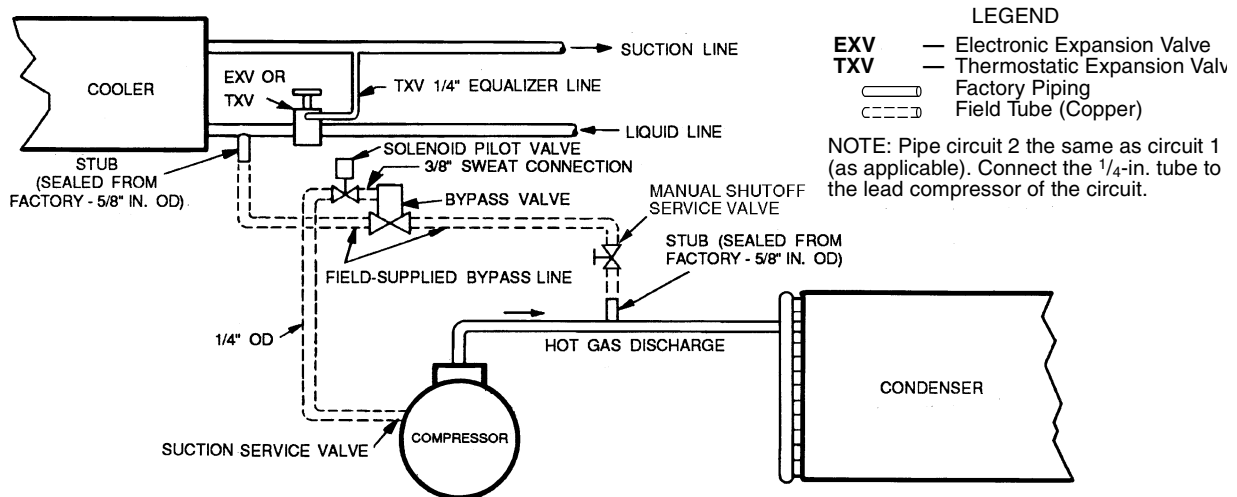
**HGBP** — Hot Gas Bypass

\*One relay required per circuit.

†Two are needed for 040-090 and Modules 230B. Four are needed for 100,110 and Modules 255B-315B. All other units require field-supplied filter driers (one per circuit).

\*\*38AK/Indoor Coil only.

††38AKS 028-044 only.



**Fig. 1 — Schematic Piping; 30GN,GT,GTN,GTR,GUN,GUR040-420**

**Solenoid Pilot Valve** — Install the solenoid pilot valve in the external equalizer line of the bypass valve. The solenoid valve has a  $\frac{3}{8}$ -in. ODF inlet and a  $\frac{1}{4}$ -in. SAE (Society of Automotive Engineers, U.S.A.) outlet. Install field-supplied  $\frac{1}{4}$ -in. OD copper tubing from the SAE connection to the suction service valve of the lead compressor in the circuit.

**Manual Shutoff** — Connect a field-supplied manual shutoff service valve in discharge line, avoiding traps in piping to hot gas bypass valve.

30GTN015-035, 30HK040-060, AND 30HL050,060 UNITS — See Fig. 3.

**Bypass Line** — Connect the field-supplied copper tubing to the factory-provided stubs (see Fig. 2) in the hot gas discharge line from the circuit A compressor and in the circuit A liquid line between expansion valve and cooler (stubs are sealed from factory). Repeat for circuit B on 30HK,HL units.

**Bypass Valve** — Install the bypass valve in the bypass line as close to the cooler as possible. This minimizes liquid storage between valve and cooler when valve is closed and prevents flood of liquid refrigerant when the valve opens. *To ensure proper closing, install the bypass valve in a horizontal section*

*of the bypass line, with the solenoid pilot valve installed vertically (coil on top).*

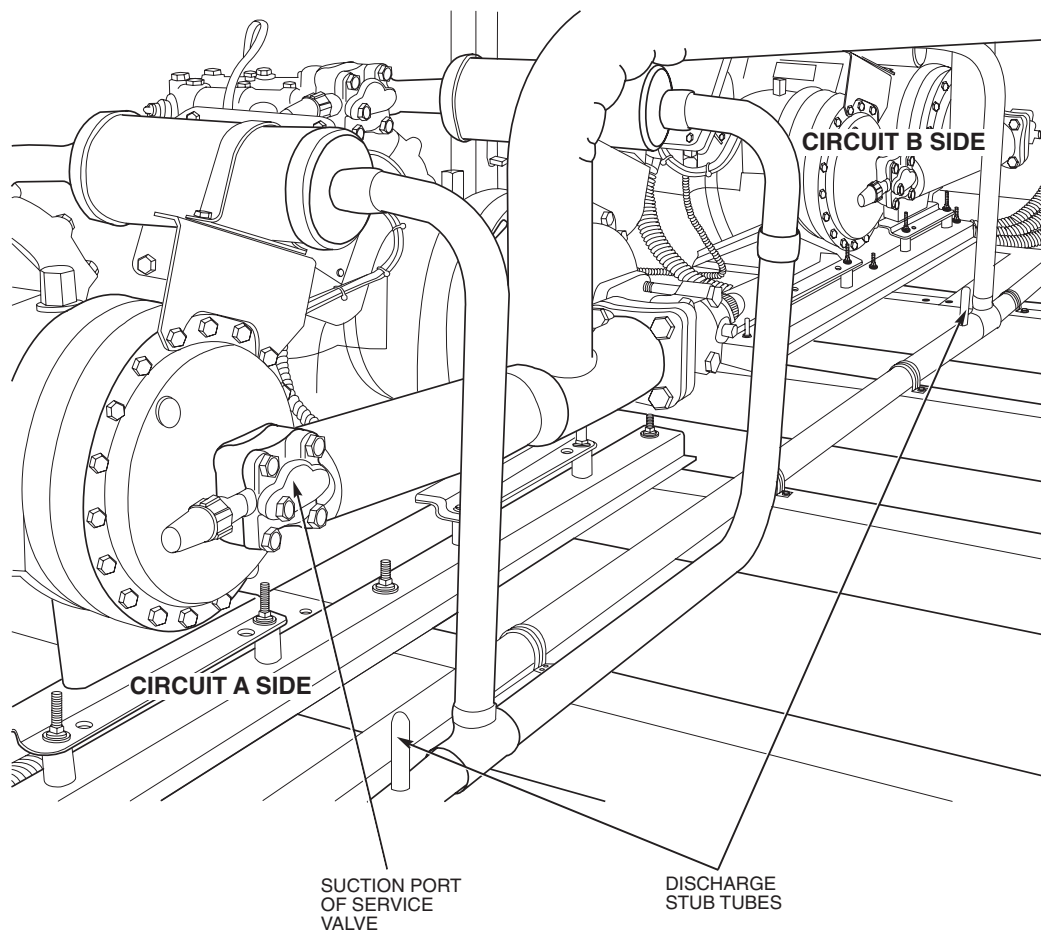
**Solenoid Pilot Valve** — Install the solenoid pilot valve in the bypass valve at the external equalizer ( $\frac{3}{8}$ -in. OD sweat connection). The outlet side of the pilot valve is a  $\frac{1}{4}$ -in. SAE (Society of Automotive Engineers, U.S.A.) thread. Run a  $\frac{1}{4}$ -in. OD, copper, field-supplied tube from this connection to the thermostatic expansion valve (TXV) equalizer line. If the connection is made directly to the TXV, use a  $\frac{1}{4}$ -in. flare x  $\frac{1}{4}$ -in. female flare tee. If the connection is made into the equalizer line, use a standard  $\frac{1}{4}$ -in. flare tee.

**Manual Shutoff** — Connect a field-supplied manual shutoff service valve in circuit A discharge line, avoiding traps in piping to hot gas bypass valve. Repeat for circuit B on 30HK,HL units.

### Step 3 — Dehydrate and Recharge Circuit —

When piping has been completed, leak test the assembly and replace the filter drier or core(s) (field supplied) for the circuit.

After core (or drier) replacement, evacuate, dehydrate, and recharge the circuit, using approved refrigerant recovery device.



**Fig. 2 — Factory-Sealed Discharge Line Stub Locations  
(30GN,GT,GTN,GTR,GUN,GUR100 Shown)**

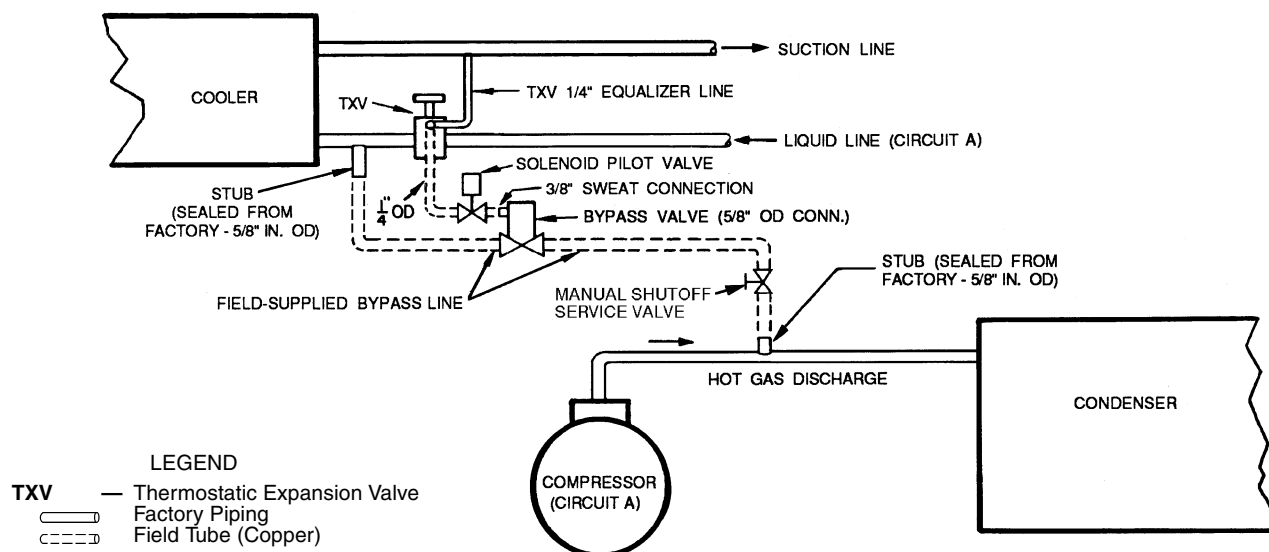


Fig. 3 — Schematic Piping; 30GTN015-035; 30HK040-060; 30HL050,060

## Step 4 — Install Control Wiring

### ⚠ WARNING

Be sure all power to the unit is off before proceeding. Tag all disconnects.

*Wires between field-installed components and unit control box must be enclosed in field-supplied conduit.* Follow all local codes and NEC (National Electrical Code U.S.A.). Wire size is no. 16 AWG (American Wire Gage) (1.5 mm<sup>2</sup>) minimum. See Fig. 4-12 for field wiring.

**30GN,GT040-420 UNITS** — Open the control box door. Mount the field-supplied hot gas bypass relays A and B (HGBPR-A, HGRPR-B) in the control box as shown on the component arrangement label diagrams (Fig. 4). On 30GT units, mount the field-supplied TDR (time-delay relay) as shown on the component arrangement label on the unit.

### ⚠ CAUTION

When mounting relays, be careful to avoid damaging electrical components and wiring in the mounting area.

**30GN Units** — Using the wires provided in the harness, wire the coil of HGBPR-A in series between J6-18 and J6-19 of the 4 IN/4 OUT module. Wire the coil of HGRPR-B in series between J6-21 and J6-22 of the 4 IN/4 OUT module. See Fig. 5.

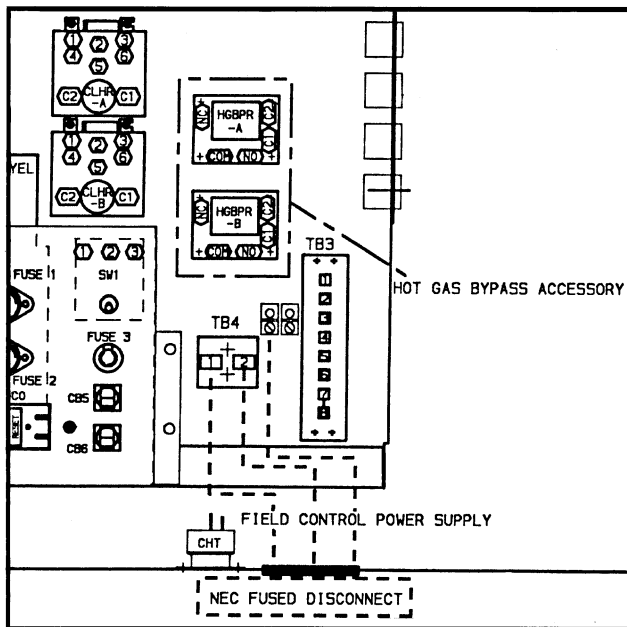
Locate a black wire in the control harness with the label HGRPR-A-COM, which originates at TRAN 5. Connect this wire to the HGBPR-A terminal COM. Connect the wires, HGBPR-A-NO and TB3-5 to the appropriate terminals per Fig. 6. For hot gas bypass on circuit B, connect the appropriate wires to HGBPR-A-COM, HGBPR-B-COM, HGBPR-A-NO, and TB3-6. See Fig. 6.

Wire in the solenoid valves. Terminal blocks are provided for easy field wiring. Wires external to the control box *must* be run in field-supplied conduit. Use one of the predrilled holes in the control box with a strain relief to run the wires to the solenoid valve from the box. Connect the hot gas bypass solenoid A (HGBPS-A) between TB3-5 and TB3-8. Connect hot gas bypass solenoid B (HGBPS-B) between TB3-6 and TB3-8. See Fig. 6. Check all electrical connections for tightness and proper location.

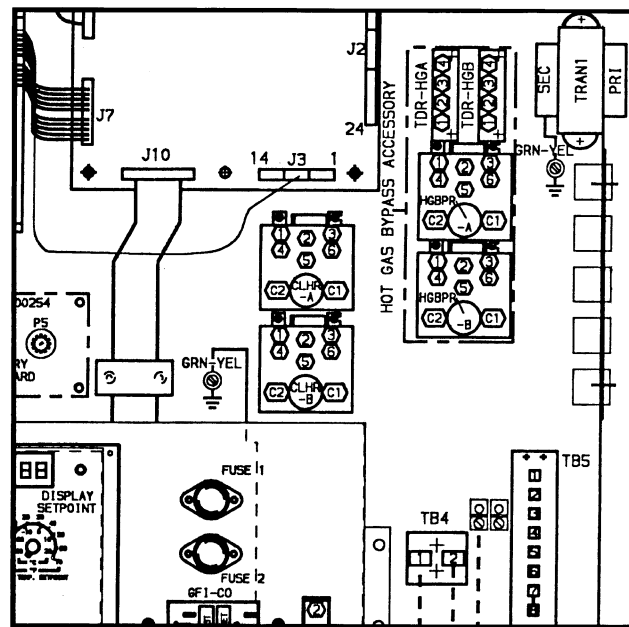
**30GN HGBP Configuration** — Once field-supplied relays are mounted in the control box, the microprocessor must be configured for the hot gas bypass option. to do this, enter the service function using the LID (local interface device). Before any changes can be made, move the LOCAL/ENABLE-STOP-CCN switch to the STOP position. The service technician must also log on to the microprocessor. To do this, press **1** **SRVC**. The LID will display the word PASSWORD. Press **1** **1** **1** **1** **ENTR**, and the LID will display LOGGEDON.

To change the configuration: Press **4** **SRVC**, and the LID will display FLD CFG. Press **↓** until HGB 0 appears in the LID display screen. Then press **1** **ENTR** for the hot gas bypass option. The display now reads HGB 1. Once the configuration is complete, press **1** **SRVC**, and the LID display will now read LOGGEDON. Press **↓** until the LID display reads LOG OFF. Press **ENTR** and the display will read EXIT LOG.

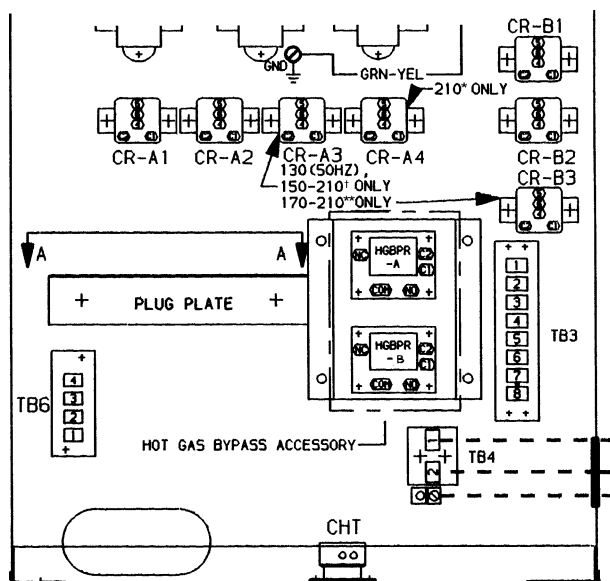
Using the test function, check the output of the relays. Press **1** **TEST** and the display will read OUTPUTS. Press **↓** until the display reads HGBRA 1. Press **ENTR** and the relay energizes. Press **↓** and the relay deenergizes. When the check has been performed, return the LOCAL/ENABLE-STOP-CCN switch to the proper position. Close and secure the control box door.



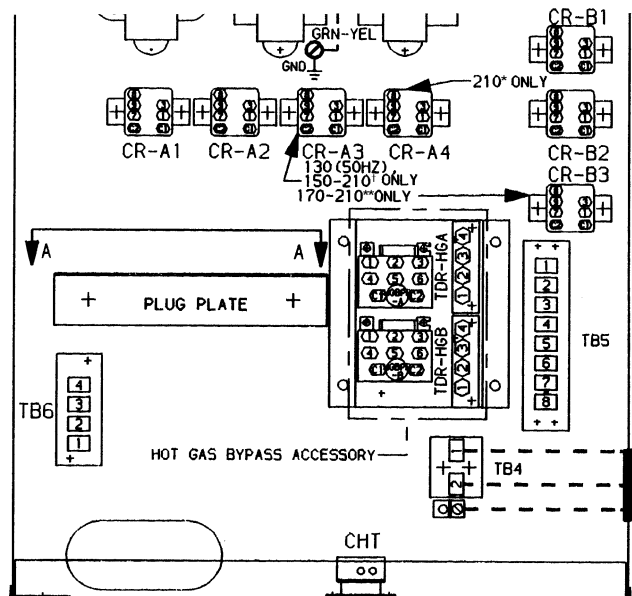
30GN UNIT: 040-110; 230B-315B MODULES



30GT UNIT: 040-110; 230B-315B MODULES



30GN UNIT: 130-210; 230A-315A, 330A/B-420A/B MODULES



30GT UNIT: 130-210; 230A-315A, 330A/B-420A/B MODULES

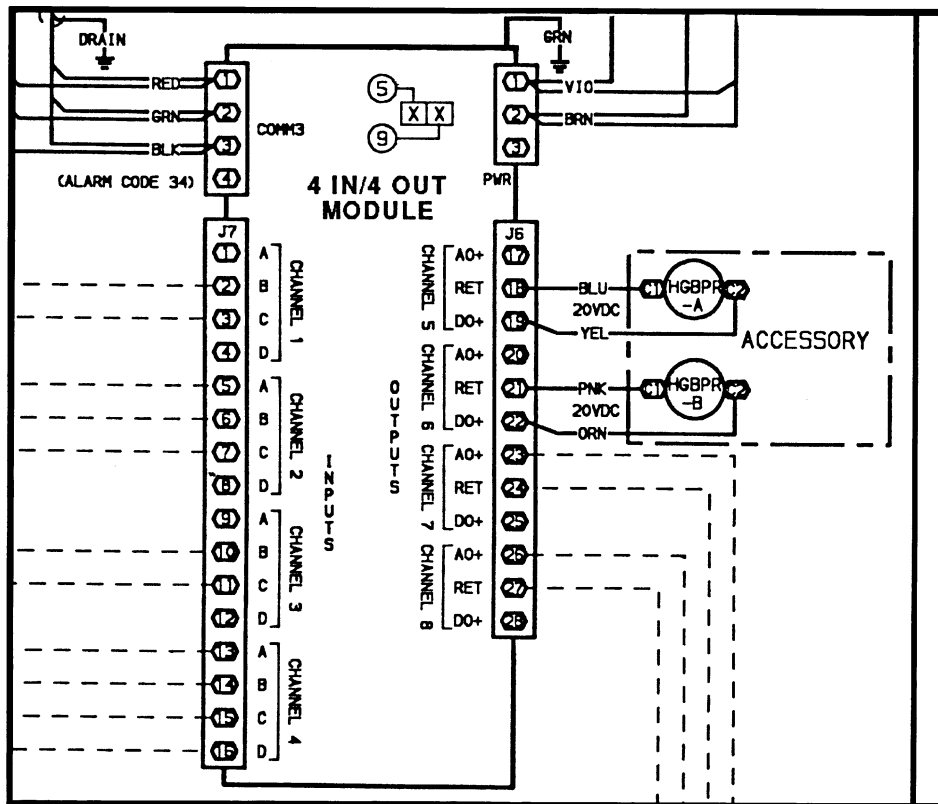
#### LEGEND

**C** — Contactor  
**CB** — Circuit Breaker  
**CHT** — Cooler Heater Thermostat  
**CLHR** — Cooler Heater Relay  
**COM** — Communication  
**CR** — Control Relay  
**GRI-CO** — Ground Fault Interrupter — Convenience Outlet (Accessory)  
**GND** — Ground  
**HGA** — Hot Gas Circuit A  
**HGB** — Hot Gas Circuit B  
**HGBPR** — Hot Gas Bypass Relay (Field Supplied)

**NC** — Normally Closed  
**NEC** — National Electrical Code, U.S.A.  
**NO** — Normally Open  
**PRI** — Primary  
**SEC** — Secondary  
**SW** — Switch  
**TB** — Terminal Board  
**TDR** — Time-Delay Relay (Field Supplied)  
**TRAN** — Transformer  
 - - - - - Field Wiring  
 \_\_\_\_\_ Factory Wiring  
 - - - - - Accessory

\*And Modules 315A, 390A, and 420A/B.  
 †And Modules 230A-315A, 330A/B-420A/B.  
 \*\*And Modules 270A-315A, 330A/B-420A/B.

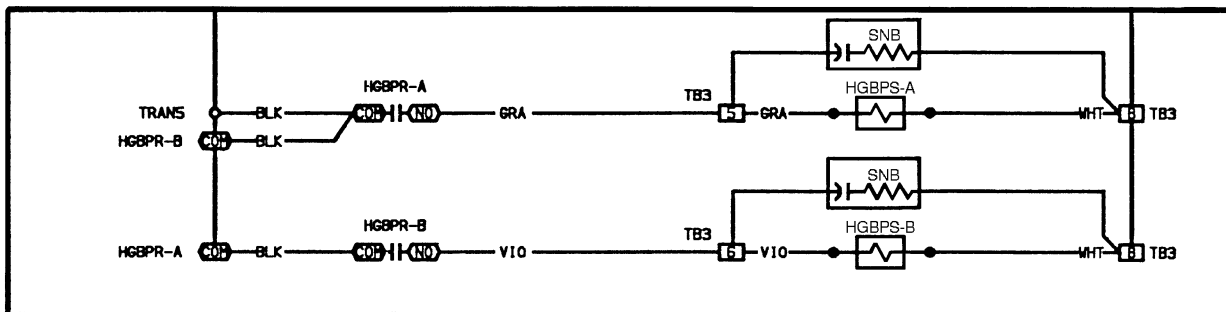
**Fig. 4 — 30GN,GT Hot Gas Bypass Relay Locations (Field Supplied)**



#### LEGEND

COMM — Communication  
HGBPR — Hot Gas Bypass Relay (Field Supplied)  
PWR — Power

Fig. 5 — 30GN, 20-v Hot Gas Bypass Wiring



#### LEGEND

HGBPR — Hot Gas Bypass Relay (Field Supplied)  
HGBPS — Hot Gas Bypass Solenoid  
SNB — Snubber (Electrical Noise Suppressor)  
TB — Terminal Block  
TRAN — Transformer

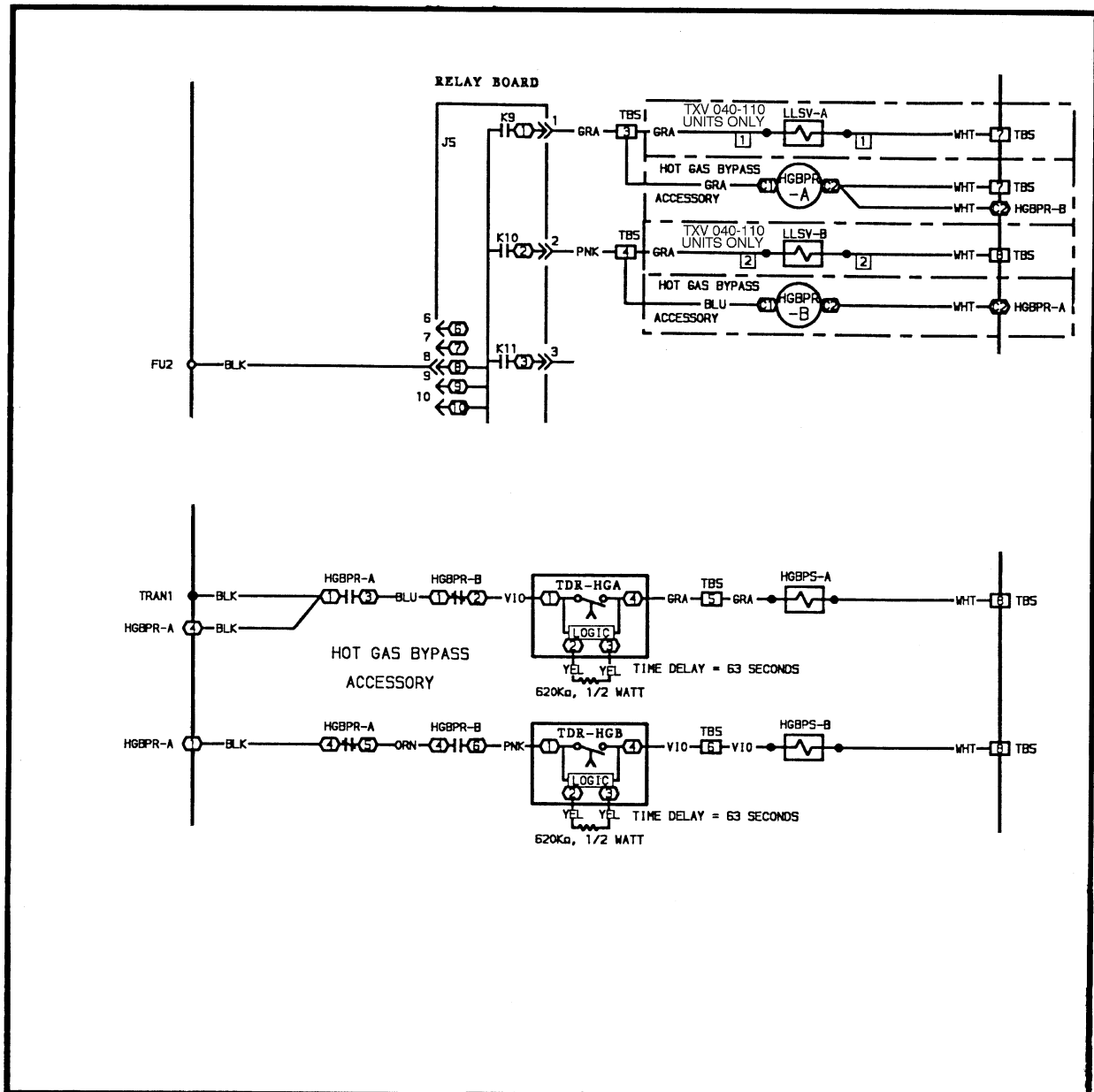
Fig. 6 — 30GN, 115/230-v Hot Gas Bypass Wiring

**30GT Units** — All control box internal wiring is supplied from the factory in a harness assembly. Connect the coil of HGBPR-A in series between TB5-3 and TB5-7. (Connect the wires marked HGBPR-A-C1, HGBPR-A-C2 to the appropriate terminals.) See Fig. 7 (top section). Wire the coil of HGBPR-B in series between TB5-4 and HGBPR-A-C2. (Connect the wires marked HGBPR-B-C1 and HGBPR-B-C2 to the appropriate terminals.) See Fig. 7 (top section).

For hot gas bypass on circuit A, locate a black wire in the control harness with the label HGBPR-A-1, which originates at TRAN 1. Connect the wires to the HGBPR-A-B, HGBPR-B-1, HGBPR-B-2, TDR-HGA-1, TDR-HGA-4, and TB5-5 to the correct terminals. See Fig. 7 (bottom section). For hot gas bypass on circuit B, connect the wires labeled HGBPR-A-1,

HGBPR-A-4, HGBPR-A-5, HGBPR-B-4, HGBPR-B-6, TDR-HGB-1, TDR-HGB-4, and TB5-6 to their correct terminals. See Fig. 7 (bottom section). Connect the 620,000-ohm, 1/2-w, field-supplied resistor across terminals 2 and 3 of the time-delay relay. Repeat this procedure for the other time-delay relay.

Wire in the solenoid valves. Terminal blocks are provided for easy field wiring. Wiring external to the control box **must** be run in field-supplied conduit. Use one of the 7/8-in. (22-mm) holes in the control box with a strain relief to run the wires to the solenoid A (HGBPS-A) between TB5-5 and TB5-8. Connect hot gas bypass solenoid B between TB5-6 and TB5-8. See Fig. 7. Check all electrical connections for proper location and tightness. Close and secure control box door.



#### LEGEND

HGA	— Hot Gas Circuit A	TB	— Terminal Block
HGB	— Hot Gas Circuit B	TDR	— Time-Delay Relay (Field Supplied)
HGBPR	— Hot Gas Bypass Relay	TRAN	— Transformer
HGBPS	— Hot Gas Bypass Solenoid	TXV	— Thermostatic Expansion Valve
LLSV	— Liquid Line Solenoid Valve		

**Fig. 7 — 30GT040-420 HGBP (Hot Gas Bypass) Wiring**



**30GTN,GTR,GUN,GUR040-420 Units** — Open the control box door. Locate terminal block TB5. See Fig. 8. Using field-supplied wiring, conduit and fittings wire both solenoid valves. Wires external to the control box must be run in field-supplied conduit. Use one of the predrilled holes in the control box to run the wires to pilot the solenoid valves from the control box. Connect one lead from each of the solenoids to terminal block TB5-9. Connect the other lead from each solenoid to TB5-12. See Fig. 9.

**30GTN,GTR,GUN,GUR040-420 Configuration** — Once the installation and wiring of both solenoid valves is complete, the control must be configured for the hot gas bypass option. To do this, place the Enable/Off/Remote Contact switch in the Off position. Using the Scrolling Marquee display or Navigator display, select the Configuration mode LED (press the Escape key until the screen is blank and use the arrow keys to illuminate the LED). Press the Enter key and then the down arrow key to display 'OPT1'. Press the Enter key again and use the down arrow key until 'HGB.S' is displayed. Press the Enter key twice. The words 'PASS' and 'WORD' will flash. Press the Enter key 4 times for the standard '1111' password. Use the arrow keys if necessary to correctly enter unique passwords. Once the password is entered, press the Enter key so that 'NO' flashes. Use either arrow key to change the value to 'YES' and press Enter. Follow the instructions given in the Control Start-Up, Operation, Service and Troubleshooting manual and use the Service Test mode to verify proper operation of the solenoids (illuminate the Service Test LED, enable the Test mode using the 'TEST' sub-mode and enter the 'COMP' sub-mode to test the output 'HGBP'). Note that both solenoids are wired in parallel and will be energized at the same time. When the test has been completed, disable the 'TEST' mode and return the Enable/Off/Remote Contact switch to the proper position. Close and secure the control box door.

**30HK040-060, 30HL050-060 Units** — Open the control box door. Locate terminal block TB2. See Fig. 10. Using field-supplied wiring, conduit and fittings wire both pilot solenoid valves. Wires external to the control box must be run in field-supplied conduit. Use one of the predrilled holes in the control box to run the wires to the solenoid valves from the control box. Connect one lead from each of the solenoids to terminal block TB2-3. Connect the other lead from each solenoid to TB2. See Fig. 11.

**30HK040-060, 30HL050-060 Configuration** — Once the installation and wiring of both solenoid valves is complete, the control must be configured for the hot gas bypass option. To do this, place the Enable/Off/Remote Contact switch in the Off position. The Scrolling Marquee display or Navigator or a CCN device such as Service Tool must be used.

**30GTN015-035 Units** — Open the control box door. Remove the inner panel. Remove the compressor junction box cover. Locate the capped orange and white wires labeled 'HGBP'. The wire nuts are to be removed and these wires should be removed from the junction box strain relief and routed to the solenoid coil. Using field wire nuts, connect one lead of the solenoid to the orange wire and connect the other lead of the solenoid to the white wire. See Fig. 12.

**30GTN015-035 Configuration** — Once the installation and wiring of the solenoid valve is complete, the control must be configured for the hot gas bypass option. To do this, place the Enable/Off/Remote Contact switch in the Off position. The Scrolling Marquee, Navigator or a CCN device such as Service Tool must be used.

**30GTN015-035 and 30HK,HL Configuration with Scrolling Marquee Display or Navigator** — Using the Scrolling Marquee or Navigator display, select the Configuration mode LED (press the Escape key until the screen is blank and use the

arrow keys to illuminate the LED). Press the Enter key and then the down arrow key to display 'OPT1'. Press the Enter key again and use the down arrow key until 'HGB.S' is displayed. Press the Enter key twice. The words 'PASS' and 'WORD' will flash. Press the Enter key 4 times for the standard '1111' password. Use the arrow keys if necessary to correctly enter unique passwords. Once the password is entered, press the Enter key so that 'NO' flashes. Use either arrow key to change the value to 'YES' and press Enter.

**30GTN015-035 and 30HK,HL Configuration with Service Tool** — Using the Service Tool, select the Carrier Controls option from the menu. Select the chiller to be configured or Add, Upload and then Select the chiller. Once selected, choose Modify, controller and then the OPTIONS1 table. Press the 'F2' key and choose Upload for the current configurations. Select Save and then Edit. Highlight the second item in the table, 'Hot Gas Bypass Select' and use the spacebar to change its value to 'Yes'. Press the 'F2' key, Save and then Download. Select Upload and then Enter to verify that the configuration was successfully received by the chiller.

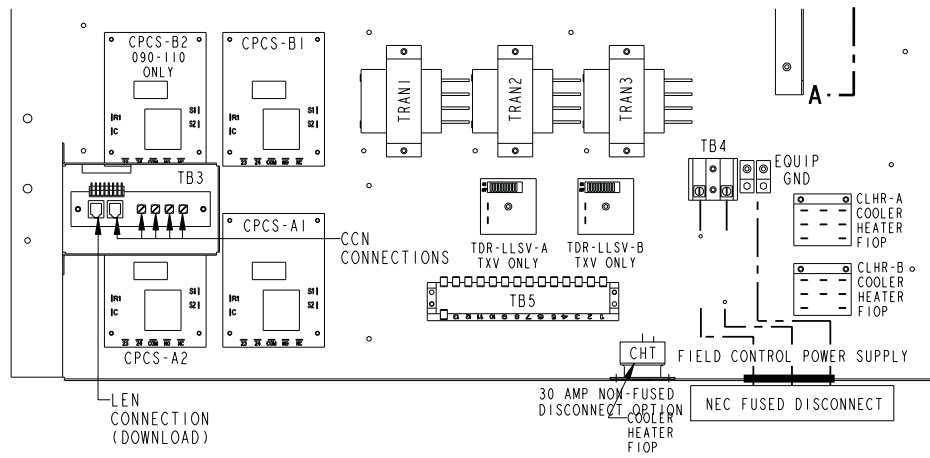
**Testing Solenoid Operation on ComfortLink™ Units** — Using the Scrolling Marquee display or Navigator display, follow the instructions given in the Controls Start-Up, Operation Service and Troubleshooting manual and use the Service Test mode to verify proper operation of the solenoid(s) (illuminate the Service Test LED, enable the Test mode using the 'TEST' sub-mode and enter the 'COMP' sub-mode to test the output 'HGBP'). Note that both solenoids (30HK,HL units) are wired in parallel and will be energized at the same time. When the test has been completed, disable the 'TEST' mode and return the Enable/Off/Remote Contact switch to the proper position. Close and secure the control box door.

## **OPERATION AND ADJUSTMENT (30GN,GT,GTN,GTR,GUN,GUR,HK,HL CHILLERS)**

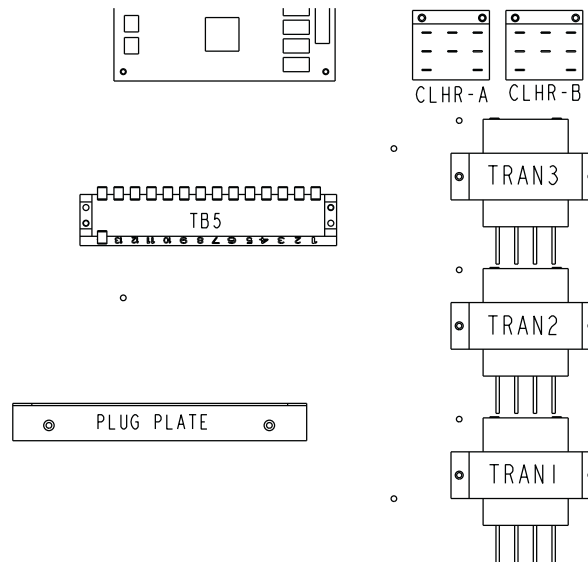
The bypass valve is factory set to begin opening when suction pressure drops to about 62 psig (427 kPa). This pressure corresponds to a chilled fluid controller set point of approximately 44 F (7 C). For R-134a systems (30GUN,GUR) the valve will need to be adjusted. Recommended setting for 44 F (7 C) leaving water is approximately 30 psig (206 kPa). If the chilled fluid set point is lower than 44 F (7 C), it will be necessary to decrease the bypass valve setting for proper operation. Conversely, for chilled fluid set points above 44 F (7 C), the bypass valve setting must be increased. A change in condensing temperature will also require a change in bypass valve set point. As condensing temperature decreases, decrease the bypass valve set point until it opens at the desired conditions. A <sup>5</sup>/<sub>16</sub>-in. hex wrench is required. Remove the cap and turn the adjustment nut with the hex wrench. A clockwise rotation increases the setting, and counterclockwise rotation decreases the setting.

**30GN Units** — When the lead compressor is started, the HGBPR (hot gas bypass relay) is energized if the compressor unloader is active, completing a circuit to the appropriate HGBPS (hot gas bypass solenoid) and opening the solenoid valve. The time delay for the circuit pressures to stabilize is accomplished by the microprocessor. If the circuit suction pressure is below the setting of the hot gas bypass valve, the valve begins to open. The valve continues to open until it either reaches an equilibrium, or the maximum open position is reached. Discharge gas is bypassed into the mixed phase line between the expansion valve and the cooler. This condition continues until the suction pressure rises above the setting or the unit cycles off.



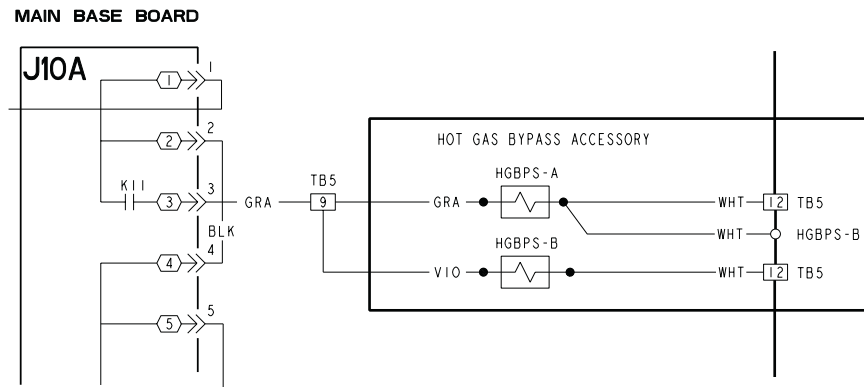


30GTN,GTR,GUN,GUR040-110; 230B-315B MODULES  
(080-110, 230B-315B SHOWN)



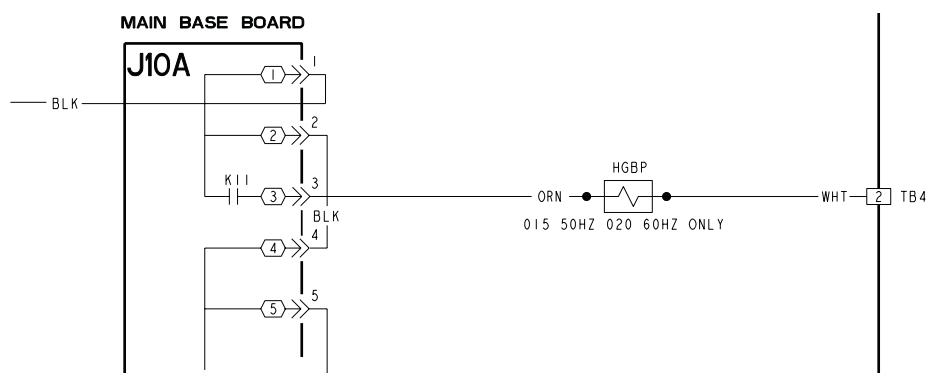
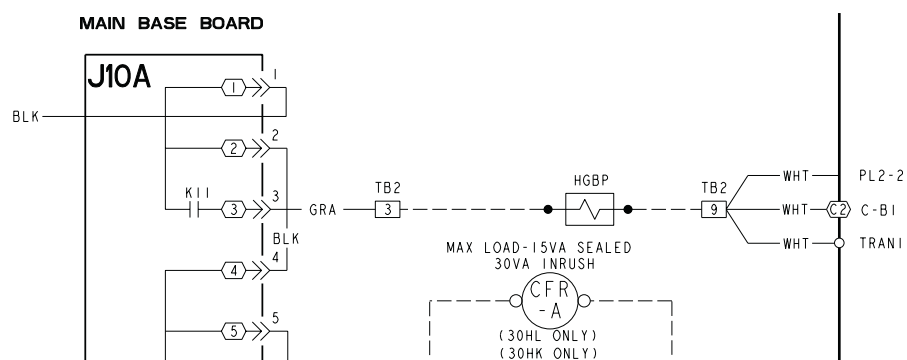
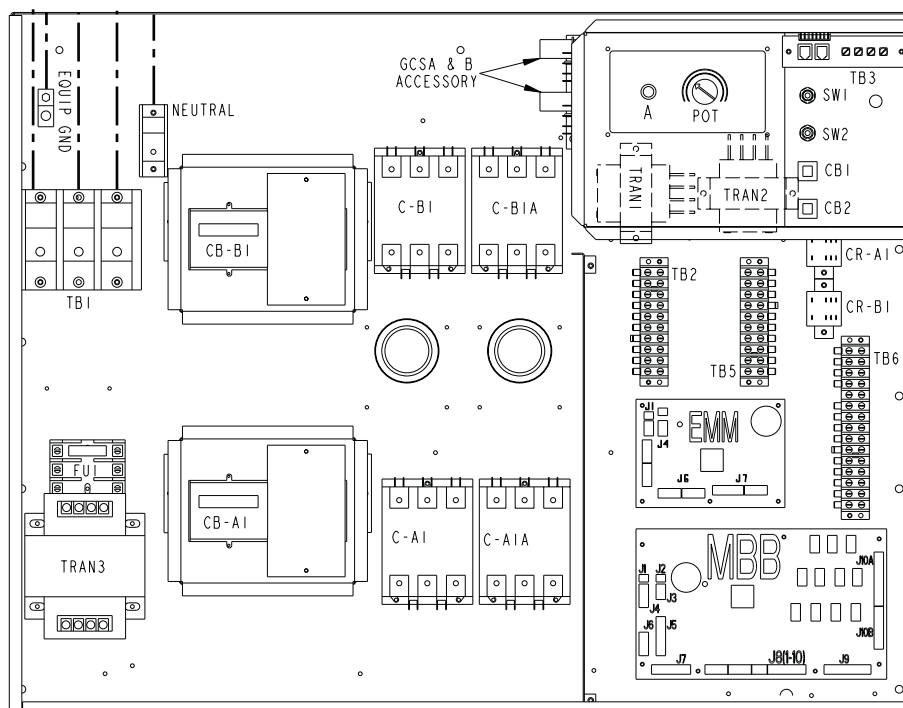
30GTN,GTR,GUN,GUR130-210; 230A-315A; 330A/B-420A/B MODULES

**Fig. 8 — Hot Gas Bypass Component Locations**



30GTN,GTR,GUN,GUR040-420

**Fig. 9 — Hot Gas Bypass Wiring**



**30GT Units** — With a call for the first compressor, the HGBPR (hot gas bypass relay) is energized, completing a circuit to the appropriate TDR-HG (time delay relay-hot gas). The field-supplied 620,000 ohm, 1/2-w resistor permits approximately a one-minute time delay for the circuit pressures to stabilize. After the time delay has completed its cycle, the HGBPS (hot gas bypass solenoid) opens. If the circuit suction pressure is below the setting of the hot gas bypass valve, the valve begins to open. The valve continues to open until it either reaches an equilibrium, or the maximum open position is reached. Discharge gas is bypassed into the mixed phase line between the expansion valve and the cooler. This condition continues until the suction pressure rises above the setting or the unit cycles off.

**All ComfortLink™ Units** — When the lead compressor is started, the HGBP (hot gas bypass) solenoids are energized. The unloader(s) on the lead compressor is also energized when the compressor is started. If the circuit suction pressure is below the setting of the hot gas bypass valve, the valve begins to open. The valve continues to open until it either reaches an equilibrium, or the maximum open position is reached. Discharge gas is bypassed into the mixed phase line between the expansion valve and the cooler. This condition continues until the suction pressure rises above the setting. The hot gas bypass solenoid(s) are only used at the first stage of capacity when starting the lead compressor and as the last stage of capacity before shutting down the lead compressor. The solenoids are not energized when the lag circuit starts even if the lead compressor in the lag circuit is the only compressor running in the circuit. The hot gas bypass solenoid(s) are deenergized when the unit cycles off.

**30HK040-060, 30HL050-060 CONFIGURATION** — Once the installation and wiring of both solenoid valves is complete, the control must be configured for the hot gas bypass option. To do this, place the Enable/Off/Remote Contact switch in the Off position. The Scrolling Marquee, Navigator or CCN device such as Service Tool must be used.

**30HK, HL CONFIGURATION WITH SCROLLING MARQUEE OR NAVIGATOR** — Using the Scrolling Marquee or Navigator display, select the Configuration mode LED (press the Escape key until the screen is blank and use the arrow keys to illuminate the LED). Press the Enter key and then the down arrow key to display 'OPT1'. Press the Enter key again and use the down arrow key until 'HGB.S' is displayed. Press the Enter key twice. The words 'PASS' and 'WORD' will flash. Press the Enter key 4 times for the standard '1111' password. Use the arrow keys if necessary to correctly enter unique passwords. Once the password is entered, press the Enter key so that 'NO' flashes. Use either arrow key to change the value to 'YES' and press Enter.

**30HK,HL CONFIGURATION WITH SERVICE TOOL** — Using the Service Tool, select the Carrier Controls option from the menu. Select the chiller to be configured or Add, Upload and then Select the chiller. Once selected, choose Modify, Controller and then the OPTIONS1 table. Press the 'F2' key and choose Upload for the current configurations. Select Save and then Edit. Highlight the second item in the table, 'Hot Gas Bypass Select' and use the spacebar to change its value to 'Yes'. Press the 'F2' key, Save and then Download. Select Upload and then Enter to verify that the configuration was successfully received by the chiller.

Using the Scrolling Marquee or Navigator display, follow the instructions given in the Controls Start-Up, Operation, Service and Troubleshooting manual and use the Service Test mode to verify proper operation of the solenoids (illuminate the Service Test LED, enable the Test mode using the 'TEST' sub-mode and enter the 'COMP' sub-mode to test the output 'HGBP'). Note that both solenoids are wired in parallel and will be energized at the same time. When the test has been completed, disable the 'TEST' mode and return the Enable/Off/Remote Contact to the proper position. Close and secure the control box door.

## INSTALLATION IN 38AKS, AH/INDOOR FAN COIL (CONSTANT VOLUME) SPLIT SYSTEM COMBINATION

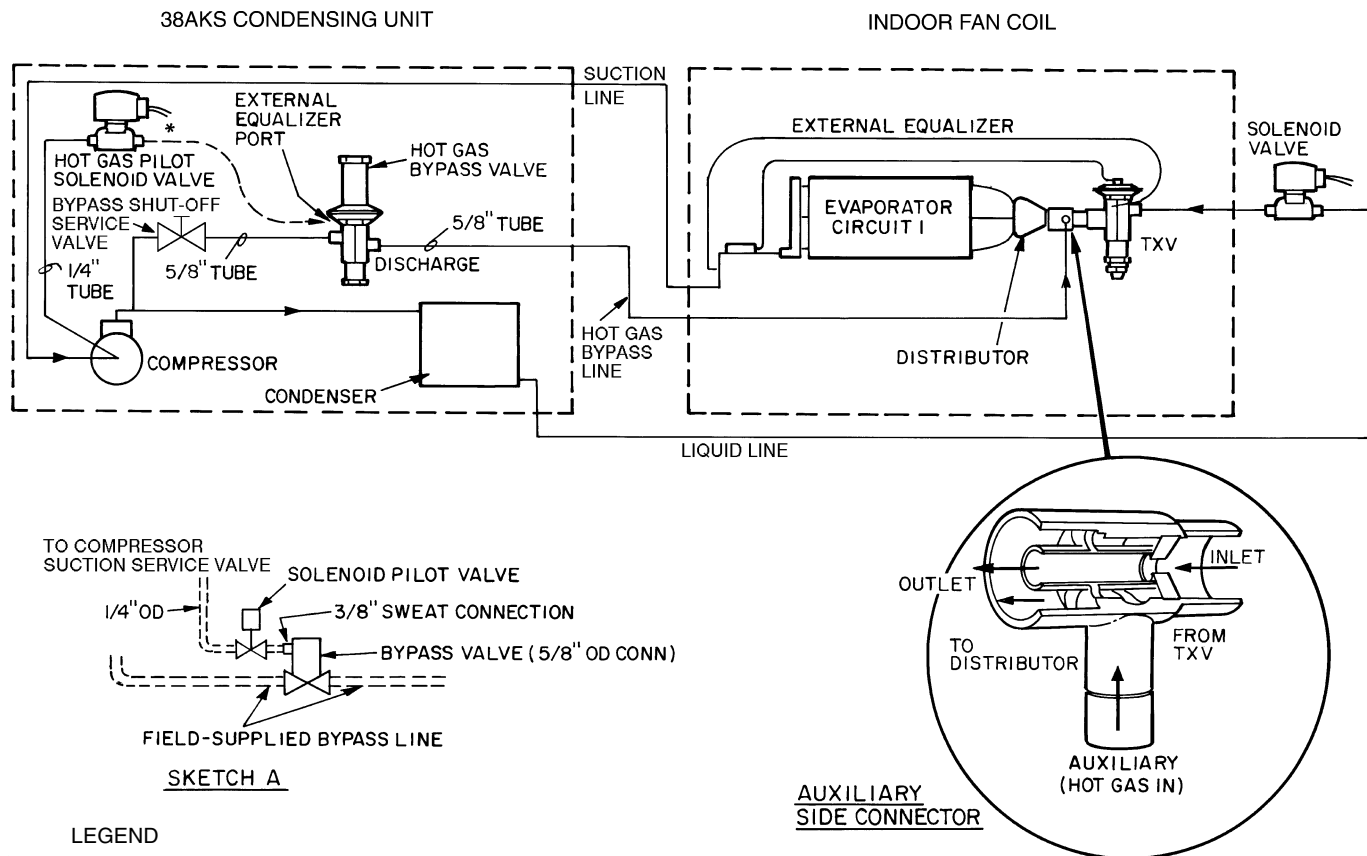
NOTE: Application of hot gas bypass to 38AKS VAV (variable air volume) systems is addressed in 38AKS/39E application literature.

### Step 1 — Install Piping (See Fig. 13)

#### ▲ WARNING

Shut off all power to the unit and remove refrigerant charge using an approved refrigerant recovery device before proceeding with installation.

1. In applications where the air handler refrigerant distributor is not equipped with a side outlet connection, it is recommended that a Sporlan in-line auxiliary side connector with standard distributor be used. Refer to the installation instructions for the indoor fan coil to obtain nozzle size and distributor connection size. Select the auxiliary side connector based on this information. The side connector must be installed on refrigerant circuit no. 1 (first stage of cooling) of the fan coil being used.
2. Install a field-supplied 1/4-in. NPT to 1/4-in. flare fitting on the gage connection port of the compressor suction service valve.
3. Sweat the pilot solenoid valve supplied in the hot gas accessory package **directly** to the hot gas bypass valve on the 3/8-in. ODF external equalizer port.
4. Install field-supplied 1/4-in. copper tube (flared with a nut on each end) between the compressor suction valve and the hot gas pilot solenoid valve.
5. Connect a field-supplied 5/8-in. OD copper tube between the discharge line process tube (hot gas stub) and a field-supplied manual shutoff service valve, avoiding any traps in piping.
6. Connect another field-supplied 5/8-in. OD copper tube between the manual shutoff valve outlet and the hot gas bypass valve inlet.
7. Connect a field-supplied 5/8-in. OD copper tube between the leaving side of the hot gas bypass valve and the Sporlan auxiliary side connector (distributor-side connector).



**Fig. 13 — Hot Gas Bypass Piping**

## Step 2 — Install Control Wiring (See Fig. 14-17)

38AKS028-044

1. Install a field-supplied relay with a 24-v coil (HN61KK324 suggested) and normally closed contacts rated for 20 va at 125 vac inductive load. Mount this relay near the control relay (CR1) in the 38AKS control box.

NOTE: This relay is identified in Fig. 14 as HGR (hot gas relay).

### 2. COIL WIRING

Connect a field-supplied wire between TB3-3 and HGR-1 (L1 side of coil). Connect a field-supplied wire between TB3-7 and HGR-3 (L2 side of coil).

### 3. SOLENOID WIRING

- a. Add a field-supplied wire between TB2-2 and HGR-5.
- b. Connect one leg of the hot gas bypass solenoid to HGR-6.
- c. Connect the other wire from the hot gas bypass solenoid to terminal TB2-3.

38AH024-034

1. Install a field-supplied relay with a 115-v coil (HN61KJ510 suggested) and normally closed contacts rated for 20 va at 125 vac inductive load. Mount this relay near the control relay (CR1) in the 38AH control box.

NOTE: This relay is identified in Fig. 15 as HGR (hot gas relay).

### 2. COIL WIRING

Connect a field-supplied wire between TB3-3 and HGR-1 (L1 side of coil). Connect a field-supplied wire between TB3-1 and HGR-3 (L2 side of coil).

### 3. SOLENOID WIRING

- a. Add a field-supplied wire between TB3-2 and HGR-4.
- b. Connect one leg of the hot gas bypass solenoid to HGR-5.
- c. Connect the other wire from the hot gas bypass solenoid to terminal TB3-1.

## 38AH044-084 SINGLE CIRCUIT APPLICATIONS

1. Install a field-supplied relay with a 115-v coil (HN61KJ510 suggested) and normally closed contacts rated for 20 va at 125 vac inductive load. Mount this relay near the control relay (CR1) in the 38AH control box.

NOTE: This relay is identified in Fig. 16 as HGR (hot gas relay).

### 2. COIL WIRING

Connect a field-supplied wire between TB3-3 and HGR-1 (L1 side of coil). Connect a field-supplied wire between TB3-7 and HGR-3 (L2 side of coil).

### 3. SOLENOID WIRING

- a. Add a field-supplied wire between TB3-5 and HGR-4.
- b. Connect one leg of the hot gas bypass solenoid to HGR-5.
- c. Connect the other wire from the hot gas bypass solenoid to terminal TB3-7.

## 38AH044-104 DUAL CIRCUIT APPLICATIONS

1. Install a field-supplied relay with a 115-v coil (HN61KJ510 suggested) and normally closed contacts rated for 20 va at 125 vac inductive load. Mount this relay near the control relay (CR1) in the 38AH control box.

NOTE: This relay is identified in Fig. 17 as HGR (hot gas relay).

## 2. COIL WIRING

Connect a field-supplied wire between TB4-2 and HGR-1 (L1 side of coil). Connect a field-supplied wire between TB3-8 and HGR-3 (L2 side of coil).

## 3. SOLENOID WIRING

- Add a field-supplied wire between TB3-5 and HGR-4.

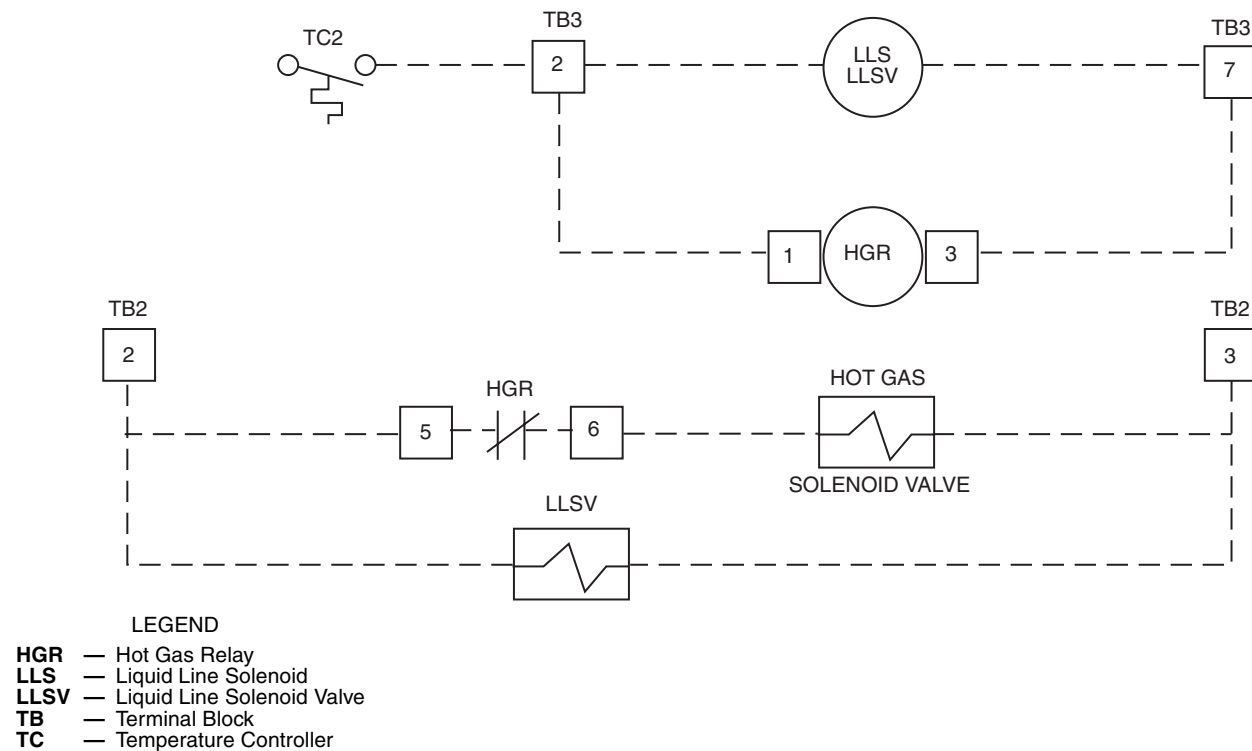
- Connect one leg of the hot gas bypass solenoid to HGR-5.

- Connect the other wire from the hot gas bypass solenoid to terminal TB3-7.

**Step 3 — Restore Refrigerant Charge** — Charge unit in accordance with 38AKS/38AH Charging Chart found on unit.

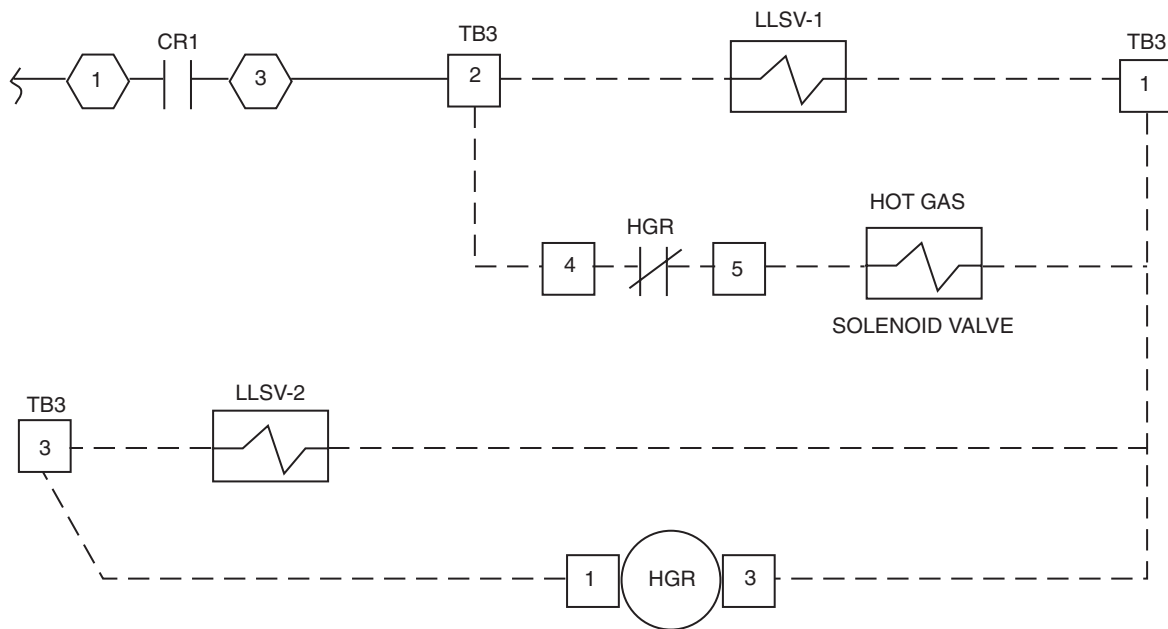
## TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	SOLUTION
Hot gas bypass valve fails to open.	<ol style="list-style-type: none"> <li>1. Dirt or foreign material in valve.</li> <li>2. Equalizer passageway clogged.</li> <li>3. External equalizer not connected or equalizer line is pinched shut.</li> </ol>	<ol style="list-style-type: none"> <li>1. Disassemble and clean valve.</li> <li>2. Disassemble and clean valve.</li> <li>3. Connect or replace equalizer line. Check solenoid valve.</li> </ol>
Hot gas bypass valve fails to close.	<ol style="list-style-type: none"> <li>1. Dirt or foreign material in valve.</li> <li>2. Diaphragm failure.</li> </ol>	<ol style="list-style-type: none"> <li>1. Disassemble and clean valve.</li> <li>2. Replace element only.</li> </ol>



NOTE: Hot Gas Relay (HGR) uses P/N HN61KK324.

**Fig. 14 — 38AKS028-044 HGBP Wiring Modifications**

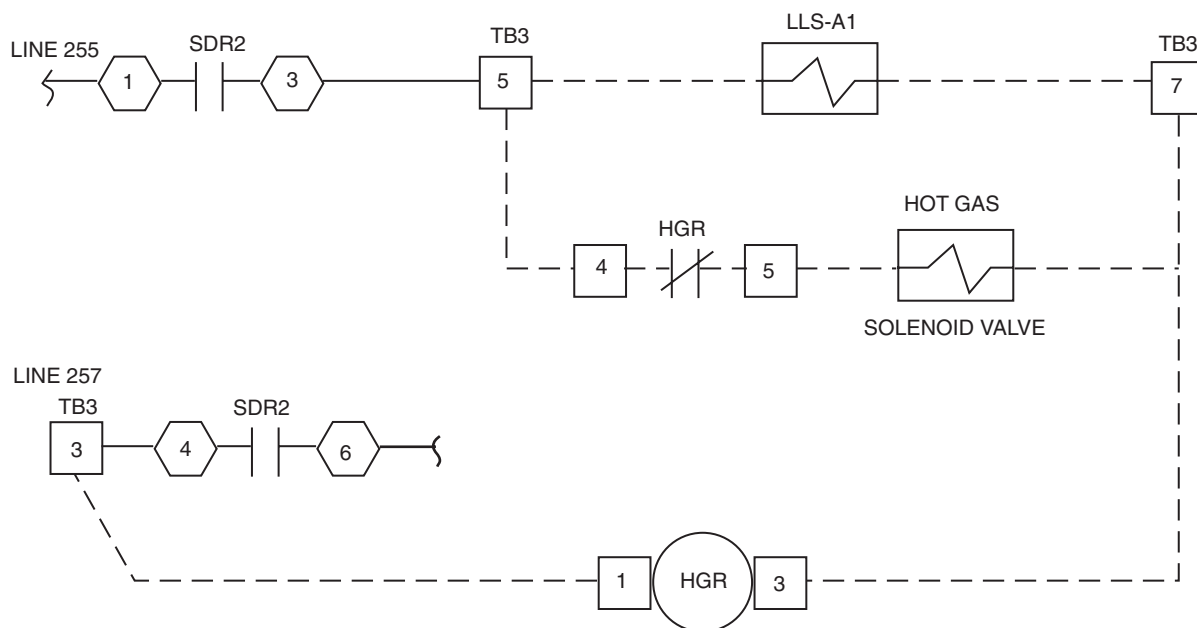


#### LEGEND

**CR** — Control Relay  
**HGR** — Hot Gas Relay  
**LLSV** — Liquid Line Solenoid Valve  
**TB** — Terminal Block

NOTE: Hot Gas Relay (HGR) uses P/N HN61KJ510.

**Fig. 15 — 38AH024-034 HGBP Wiring Modifications**

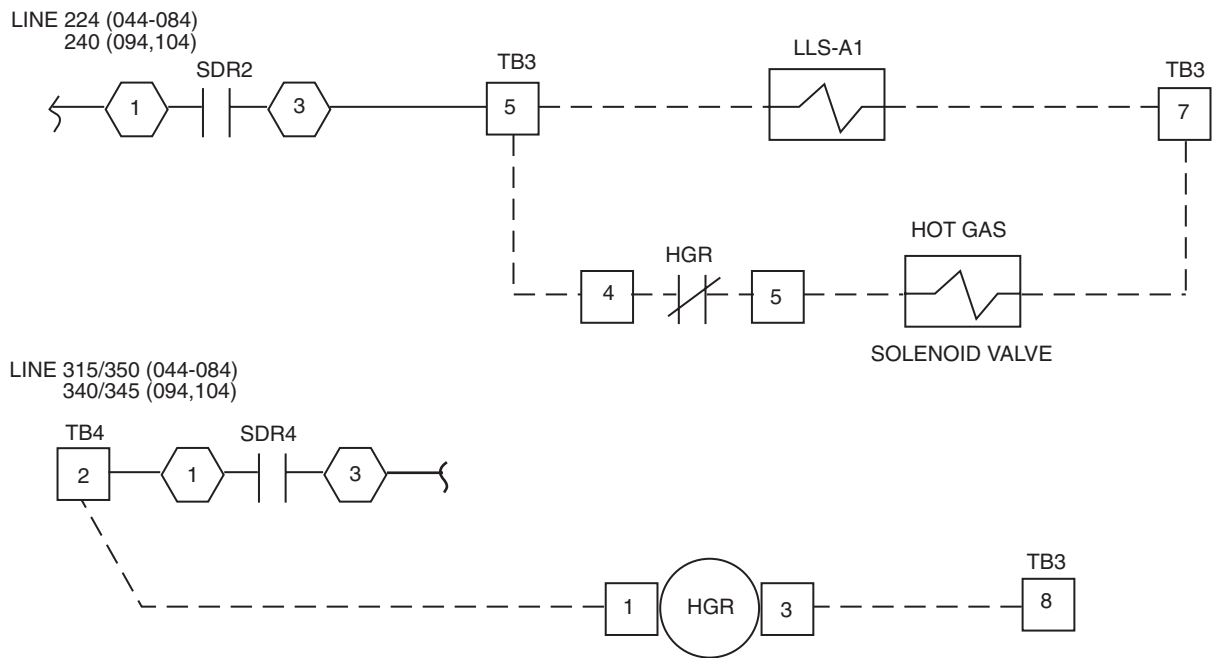


#### LEGEND

**HGR** — Hot Gas Relay  
**LLS** — Liquid Line Solenoid  
**SDR** — Solenoid Drop Relay  
**TB** — Terminal Block

NOTE: Hot Gas Relay (HGR) uses P/N HN61KJ510.

**Fig. 16 — 38AH044-084 Single Circuit HGBP Wiring Modifications**



#### LEGEND

**HGR** — Hot Gas Relay  
**LLS** — Liquid Line Solenoid  
**SDR** — Solenoid Drop Relay  
**TB** — Terminal Block

NOTE: Hot Gas Relay (HGR) uses P/N HN61KJ510.

**Fig. 17 — 38AH044-104 Dual Circuit HGBP Wiring Modifications**



